Phys 410

Fall 2013

Homework #5

Due Thursday, 10 October, 2013

All problems are from Taylor, *Classical Mechanics*.

1) Problem 9.2 Artificial gravity on a space station
2) Problem 9.7 Time derivative of vector in rotating frame
3) Problem 9.9   Coriolis force
4) Problem 9.14   Surface profile of water in a rotating bucket
5) Problem 9.19 Circular motion with different initial conditions
6) Problem 9.20 Spiral motion [*Hint: see Section 5.4- Critical Damping for the 2nd solution to the diff. eq.*]
7) Problem 9.28 Coriolis effect and shell trajectories
8) Problem 9.33 Foucault pendulum initial condition
9) Problem 6.1 Geodesic on a sphere
10) Problem 6.4   Snell's law [*Hint: the time for light to traverse each path is the path length divided by the speed of light v = c/n*]

Extra Credit

1) Problem 6.24   An optical "cloaking device"